Glossary

Note: These terms are defined in relation to their use in this manual for environmentally sensitive maintenance for dirt and gravel roads

ADT: Average Daily Traffic.

Bank Gouging: A problematic practice during grading operations or ditch cleaning where the grader operator cuts into the toe of a stable bank and creates a vertical surface, destabilizing the bank and creating erosion and sediment.

Bed Load: Larger particles on the stream bottom that move by sliding, bouncing, or rolling along the bottom in response to stream flow.

Bench: A step or series of steps cut into and across a steep embankment to catch water and prevent it from running over the face of the bank, creating erosion and sediment pollution. The bench should be sloped to prevent over the bank flow and drain to an appropriate outlet.

Bioengineering: Techniques combining the biological elements of using live plants with engineering design concepts for slope protection and erosion reduction, used effectively in restoration of many stream and upland banks.

Broad Based Dip: Shallow gradual dips skewed across the road in the direction of water flow, used to outlet ditch flows to the other side of the road where outletting is prevented by a high embankment on one side of the road with a downhill grade.

Capillary flow: the percolation or vertical seepage of water through soil. (Fine soils tend to increase capillary flow, with the soil acting like the wick of a kerosene heater sucking water upward.)

Colonizer Trees: Those species that are shade intolerant and thereby first to grow in cleared areas, having the characteristics of being fast-growing, short-lived, and weak-structured, making them undesirable roadside trees, as compared to the intermediate or climax species.

Culvert (pipe, drainage pipe): Enclosed channels of various materials and shapes designed to convey stream or ditch water away from the roadway.

Daylighting: A traditional practice of removing all trees from the roadside to allow sunlight to penetrate through to the road surface in order to dry the road to prevent road deterioration from water and to prevent snow and ice buildup. This practice is also used to improve motorists' sight distance for greater safety. (Caution: This may not be the best practice for dirt and gravel roads in forested areas – refer to Manual Chapter 6.)

Ditch Turnout (ditch outlets, tail ditch, bleeders): A formed channel that diverts ditch water away from the road, usually angled in the direction of water flow and placed at locations to empty into a vegetative filtering area.

Diversion Swale (diversion channel, interceptor ditch): A water conveyance channel constructed across the bottom of a slope for the purpose of intercepting surface runoff to minimize erosion and prevent excess flows into lower lying areas. Most often diversion swales intercept water from an uphill slope and divert it away from the road and roadside ditch to a stabilized outlet area or infiltration back into the ground.

Dust: Fine road material ground down by traffic and blowing off in the wind, indicating that the road is deteriorating.

Dust Suppressant: Any of the variety of materials used as a successful treatment to significantly reduce dust conditions on unpaved roads and helps preserve road surfaces.

Ecology: The study of interactions of organisms between one another and the physical and chemical environment in which the organisms dwell.

Ecoregions: Areas with similar characteristics reflecting the physical factors (geology, soil, hydrology, climate) that help define respective habitats, and in turn determine the type of animals and plants that live in that habitat.

Ecosystems: A smaller unit within an ecoregion. Within each ecoregion, there are typically three types of ecosystems: streams, wetlands, and forests/uplands.

Embeddedness: the degree to which pebbles, cobbles, etc. (the larger pieces of the stream bottom) are surrounded by fine sediments. Normal embeddedness is about one third; higher degrees of embeddedness relate to problems such as lack of living space for invertebrates and lack of free-flowing water for fish eggs in gravel beds.

Endwall, End Structure: A structure placed at a pipe inlet or outlet to prevent erosion and scour around the pipe, protect the embankment, and help anchor the pipe. Endwall may be constructed from a variety of materials.

Energy Dissipater: Any device or installation of material used to reduce the energy of flowing water.

Environmentally Sensitive Maintenance: Effective practices that will not only be beneficial in protecting the natural environment, but also result in less road maintenance and associated costs.

Erosion: the eating away of a surface by water, wind, abrasion, etc.

Flared End Section (pipe end section): A manufactured flared drainage piece that fits on the end of a pipe to enhance hydraulics (water flow); can be metal, concrete, or plastic.

Flowline: The bottom of the ditch or pipe, the invert of the pipe.

Gabions: Manufactured woven wire baskets filled with stone and tied together to form a structure. Gabions are used for bank stabilization and armoring, retaining walls, culvert end structures, channel linings (gabion mattresses), etc.

Geosynthetic: Stemming from "geo" meaning "of the earth" and "synthetic" meaning "man-made"; geosynthetics are man-made materials used on or under the ground, non-biodegradable, for various purposes ranging from reinforcement and separation to drainage filtration and sediment control.

Geotextile: A geosynthetic fabric or textile manufactured from synthetic plastic polymers, non-biodegradable, in woven or non-woven types, and used for various purposes ranging from reinforcement and separation to drainage filtration and sediment control.

Grade Break: A long, gradual break in grade on a road with a relatively gradual downhill slope that improves drainage. Grade breaks limit water flow by decreasing concentration and velocity from a reduced area of road section, resulting in limited ditch and cross pipe size.

Gravel Bar: An accumulation of gravel and rock material normally occurring at a bridge structure, which interferes with the natural conditions of stream flow but can occur naturally anywhere along the stream.

Hydraulics: The mechanics of fluids, primarily water. (Engineers use hydrology to determine the amount of water that will accumulate at a particular point and then use hydraulics to determine the size of pipe channel or pipe needed to carry that amount of water.)

Hydrology: the science of water and its distribution in the air, on the surface, and underground.

Indicator Species: Certain species that are sensitive to changes within the stream system and can be analyzed in the context of the overall abundance of organisms in assessing the condition of the aquatic system.

Insloping: Sloping the entire surface of the road toward the steep uphill bank on one side of the road to eliminate drainage and erosion over the steep downhill embankment into any adjacent stream.

Intermediate or Climax Trees: Shade tolerant species having characteristics of being slow-growing, long-lived, and structurally strong, making them more desirable roadside trees for greater roadside stability and less maintenance.

Macroinvertebrates: Organisms within a stream ecosystem lacking a spinal column (invertebrate) but large enough to be seen by the naked eye (macro) – usually referring to species such as insect larvae (stoneflies, caddisflies, mayflies) that are used in evaluation of a stream's health.

Mitigation: The act of reducing or eliminating an adverse environmental impact, such as wetland mitigation where the destroyed wetland area is replaced with a new wetland of similar size and function.

Morphology: The form and structure or shape, as of a stream or rocks, in relation to the development of erosional forms or topographic features.

MSDS (Material Safety Data Sheet): A form required for all chemicals, dealing with safety in handling the material. The MSDS lists the manufacturer's name, address, and phone number; the major components of the chemical; its characteristics such as flammability and volatility, its reactivity, safety equipment needed to handle the chemical, and emergency procedures in case of spills or exposure.

Outside Inputs: Streamside vegetation such as leaves, branches, twigs, roots, and fruit that falls into or is washed into the water and becomes the basis for a food web in the stream.

Outsloping: Sloping the entire surface of the road toward the downhill side with a normal cross slope, applied when the road crosses a gentle sloping terrain. Outsloping is similar to superelevation or banking of a curve, but on a straight section of road and with no ditching. The outsloped road blends into the gentle slope of the terrain with no ditching or cross pipes, allowing the natural sheet flow conditions to prevail.

Photosynthesis: The process by which plants are able to produce their own food, using sunlight and carbon dioxide from the air with the green chlorophyll of the plant to produce sugars (food) and give off oxygen back into the air.

Pipe Apron: The area immediately adjacent to a pipe outlet, which may need to be stabilized to prevent erosion and scour.

Plant Succession: The gradual and orderly process of ecosystem development brought about by change in the plant community composition and the production of a climax characteristic of a particular geographic region. In other words, plant succession starts with bare earth and over time transitions towards mature forest.

Riparian Buffer: A strip of undisturbed vegetation between sensitive areas, such as rivers, streams, wetlands, ponds, etc., and areas of land disturbance and /or bare ground such as unpaved roads, work sites, etc.; protecting these sensitive areas from sediments and other pollutants carried by surface runoff. Wetlands often serve as riparian buffers along streams, protecting the streams from direct sediment input.

Riprap: Stones or rock placed in locations such as ditches, channels, embankments, and pipe outlets, sized to resist movement and to prevent water erosion and scour of the underlying soils.

Road Cross Slope: The slope of the road surface from the road center to the outer edges, the normal unpaved road cross slope being ½"to ¾" vertical drop for every horizontal foot of road width.

Road Crown: The center of the road being higher than the outer edges, creating a flat A-shape with a normal cross slope of ½" to ¾" per foot for unpaved gravel roads. Road crown serves the major purpose of drainage the road surface, getting the water off of the road.

Road Stabilization: The process of uniformly crushing, pulverizing, and blending of the road materials, adding a stabilizing agent, mixing the agent with the blended material, spreading and regrading the road with proper crown, and compacting.

Runoff: surface drainage due to precipitation or snow melt.

Scuppers: Bridge deck drainage systems, usually openings that allow deck surface runoff to drop directly into the stream below.

Secondary Ditch: A problematic ditch formed along the edge of the road due to a build-up of material and vegetation immediately adjacent to the road edge, preventing water from effectively running off the road surface and into the roadside ditch or swale.

Sediment: Fine particles of inorganic and /or organic matter carried by water.

Sediment Load: The amount of sediment a stream carries under the existing flow conditions.

Sedimentation: The process of deposition of sediment in areas where water velocity is not high enough to carry the sediment along.

Silt Fence (silt fence barrier, filter fabric fence): A temporary sediment control measure used to intercept sediment-laden runoff from disturbed earth areas, typically made of a porous geotextile fabric and supported by wood or metal posts.

Subdrain (subsurface drain, underdrain): A subsurface drainage facility whose prime purpose is to drain the subsurface water out of and away from the road structure to an outlet. Effective subdrains consist of a geotextile lined trench with a perforated pipe and well-draining aggregate backfill, or other prefabricated systems.

Subgrade: The surface or soils upon which the road is constructed, usually shaped with a normal crown and cross slope.

Superelevation: Sloping or "banking" the curve in the road with a uniform cross slope from one edge of the travelway to the other to offset centrifugal forces on vehicles for safer travel.

Through Drain: Cross culverts installed strategically to handle springs or spring seeps flowing perpendicular to the road, carrying the flow under (through) the road to the other side.

Topography: The configuration of a surface (land area) and the position of its physical and natural features and respective elevations.

Tracking (grooving, roughening): The practice of creating an irregular surface on a smooth bank by tracking up and down the bank with a track vehicle or any method of roughening or grooving the surface to catch rain water, reduce erosion, increase water infiltration, trap sediment, and enhance vegetative growth.

Turbidity: The degree to which suspended sediment interferes with light passage through water, the cloudiness exhibited by water carrying sediment.

Upland: Areas of higher elevation that are well drained, covered with forests or cleared for farming or that have reverted to meadows. One of the three typical ecosystems – uplands, streams, wetlands - within an ecoregion.

Vegetative Filter Strip: Any vegetated area receiving water flows in order to spread the flow, reduce flow velocity, and filter out sediment from the flow prior to the water reaching a stream.

Wetland: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions," as defined by the Federal Clean Water Act.

Water Table: The top surface of the free water in the ground and below is completely saturated.

Watershed (drainage basin, drainage area, catchment area): The area of land that drains all collected precipitation to a common low point or outlet.